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COUNTRY USSR

REPORT

SUBJECT Descriptive Manual on the Soviet APM-54 Automatic Alarm Receiver

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THIS IS UNEVALUATED INFORMATION. SOURCE GRADINGS ARE DEFINITIVE. APPRAISAL OF CONTENT IS TENTATIVE.

1. [redacted] 37-page, English-language Soviet manual entitled Automatic Alarm Receiver APM-54: Description

[redacted] No publishing data were given.

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2. The APM-54 is described as an automatic receiver for international distress signals transmitted on 500 kc/s. The booklet contains sections on the specifications, circuit diagrams, construction, installation, operation, testing, spare parts and accessories, and schematic and wiring diagrams.

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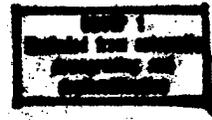


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RADIO DIRECTION FINDER RPN-47

Description and Operating Instructions

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AUTOMATIC ALARM RECEIVER

AIM-54

DESCRIPTION

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1. Purpose and Brief Specifications

The automatic alarm receiver Type *AAA-24* is designed for receiving the international alarm signal composed of twelve four second dashes followed by one second intervals and sent on the frequency of 500 Kc/s (500 m).

Note. The dash duration is allowed within 3.5 to 6.0 seconds and the space duration - within 0.01 to 1.5 seconds.

Upon the reception of three or four consecutive dashes the receiver automatically actuates the alarm signalling system.

The parameters of the receiver are as follows:

1. Modes of Waves. The selector is actuated by types - A1, A2 and B waves. The receiver provides aural reception of modulated waves only.

2. Selectivity. Attenuation of the signal while detuned for ± 18 Kc/s from the frequency of 500 Kc/s - at least 15 db. Frequency response tolerance within 492 to 508 Kc/s - not over 6 db.

3. Sensitivity - within the limits of 40 to 100 microvolts.

4. Output power - at least 6.0 mW across the load, for aural reception.

The load D.C. impedance across the output terminals should be at least 4000 ohms.

5. Power Supply Source

(d) Storage battery with a nominal voltage of 26 volts and

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D.C. mains with a nominal voltage of 110 or 220 volts.

(b) Storage battery with a nominal voltage of 26 volts and rotary converter *PY - 11 AM*.

The receiver operates normally at variations of the mains and battery voltages within $\pm 10\% - 25\%$. In case of voltage drop the receiver automatically connects the signalling system.

6. Power Consumption (minus power of bells and recorder)

(a) from 110-volt mains - not over 11.0 W,

(b) from 220-volt mains - not over 25.0 W,

(c) with this kind of supply, from 26-volt battery - not over 25.0 W,

(d) with full supply from 26-volt battery - not over 75.0 W

7. The required sensitivity of recorder - at least 1 mA.

8. The receiver operates with any kind of antenna.

2. Circuit Diagram

The receiver employs three assemblies:

(a) H.F. amplifier unit;

(b) Selector unit;

(c) Power supply, monitoring and control unit.

The H.F. amplifier unit comprises three identical amplifying stages. Each stage works into a two-tank filter tuned to the frequency of 500 Kc/s.

The bias voltages for the amplifier tubes are provided by the cathode currents across resistors R1, R2, R3.

In order to decrease the ~~supply~~ ^{S-E-C-R-E-T} back, resistor R1 in the
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first tube cathode of the H.F. amplifier is shunted by means of capacitor C4 on the chassis.

The high-voltage supply circuits of each amplifying stage comprise decoupling filters which consist of resistors RI0, RII, RI2 and capacitors C1, C2, C3.

The input of the receiver is protected from overvoltages in the antenna by the neon-filled tube // I4.

The amplifier has a deep feed back which is used to simulate the alarm signals while testing the receiver operation. The feed back loop consists of wiring capacitors C6, C7 and wire "3" which is normally shorted through the contacts of push button K2 "КОНТРОЛЬ" ("Test") to the minus lead.

When the push button is depressed, the "3" wire is isolated and the amplifier is self excited.

The amplified H.F. signal is applied to the grid of tube // 4 - anode detector.

Selector. The first stage of the selector is on anode detector (Fig.I) which in addition to its main function limits the minimum and maximum values of detected signal.

The "minimum limiting" is due to the fact that the bias which appears on dividers RI4 and RI6 exceeds the cut-off voltage.

The "maximum limiting" is due to saturation. Resistor RI5 is the load of the detector.

Capacitor CI4 provides A.C. by-pass of the load.

When modulated signals are received, the audio frequency

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currents flow through capacitor C 16 to the headphones.

The best operating conditions for the selector are provided by the absence of interference at the receiver input and the signal intensity over 50 microvolts, because in that case the voltage differences in point "a" (Fig.1), which correspond to the beginning and the end of the dashes, attain the value of 70 volts.

The voltage differences are delivered through capacitor C15 to the grids of the selector discharging tubes / 6 and / 7.

The selector comprises four monitoring circuits:

1. Circuit for monitoring the minimum value of the dash (Fig.2, a).
2. Circuit for monitoring the maximum value of the dash (Fig.2, b).
3. Circuit for monitoring the spaces (Fig.3).
4. Circuit for counting the dashes (Fig.4).

The circuits serve for monitoring the duration of the dashes and spaces as well as the number of dashes, which have been accepted by the receiver.

Each of the first three monitoring circuits employs the same unit (Figs.2 and 3) consisting of: a discharging tube (/ 6, / 7 and / 9), a controlling network which consists of a resistor and a capacitor (C18, C20, R19, C18, R22, C19), a working tube (/ 5, / 10, / 11) and a circuit of the working tube bias, which is continuous, adjusted within certain limits (R20, R25, R23, R28, R29).

The circuits for dashes monitoring operate in the following manner.

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Before the dash begins: the discharging tubes are conducting, the capacitors of the controlling networks (C18, C20) are discharged down to zero and, consequently, the working tubes are cut-off.

The beginning of the dash actuates the detector and provides a negative voltage drop across its load (R15). The drop is applied to the grids of the discharging tubes via capacitor C15 and cuts them off until the end of the dash. The cut-off results in charging the capacitors of the controlling networks (C18, C20).

The biasing in the cathodes of the working tubes (// 5 and // II) and the time constant of the controlling networks are so chosen that the // 5 tube grid-to-cathode voltage equals the cut-off voltage in 3.5 seconds after the signal begins, while the // II tube grid-to-cathode voltage is equal to the cut-off voltage in 6.0 seconds after the beginning of the signal. Consequently, the tubes can conduct normally.

The end of the dash results in a positive drop of voltage across the detector load (R15), the discharging tubes are conducting, capacitors (C18, C20) are discharged down to zero during 0.05 sec. and the working tubes are cut-off, i.e. the circuits of the dash monitoring are restored to their initial condition.

Thus, the current flows through the working tube of the circuit which monitors the minimum value of the dash only in case

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the dash continues for over 3.5 seconds. The current flows through the working tube of the circuit which monitors the maximum value of the dash only when the dash continues for over 6.0 seconds.

Consequently, the shorter dashes do not actuate these tubes.

The circuit which monitors the spaces (Fig.3) is controlled by the voltage across the load (R21) of the working tube in the circuit which monitors the minimum value of the dashes.

The space monitoring circuit operates in the following manner.

The working tube (/5) remains conductively closed when there are no dashes or when the dashes do not exceed 3.5 seconds. The cathode-loaded tube (/8) conducts normally, while the discharging tube (/9) of the space control circuit remains cut-off due to the voltage across the resistor (R27).

If such operating conditions are maintained for over 5.0 seconds, then the capacitor (C19) of the controlling network will be charged up to the voltage at which the working tube (/10) begins to conduct normally.

If the dash continues for over 3.5 seconds, then in 3.5 seconds after its beginning a negative drop of voltage appears in point "b" (Fig.2,a). It is applied through the capacitor (C17) to the grid of the cathode-loaded tube and cuts-off the letter. Consequently, the voltage across the load (R27) disappears, the discharging tube (/9) with the grounded grid conducts normally, the network capacitor (C19) is discharged in

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0.28 secs. and the working tube ($\Lambda 10$) in cut-off.

The end of the dash restores the initial operating conditions of the space monitoring circuit i.e. the tube ($\Lambda 8$) conducts normally, the tube ($\Lambda 9$) is out-off and the capacitor (C19) of the control network gets charged.

The time constant of the network and the bias in the working tube cathode are so chosen that in 5.0 seconds the grid-to-cathode voltage of tube ($\Lambda 10$) becomes equal to the cut-off voltage and the tube will begin to conduct normally.

Thus, the current flows through the working tube of the space monitoring circuit only in the case when the dashes do not exceed 3.5 seconds or when after a lesser dash follows a space of less than 1.5 seconds ($5.0 - 3.5 = 1.5$).

The circuit for counting the dashes (Fig.4) is controlled by the voltage across the cathode resistor (R27) and, therefore, is actuated only by those dashes which exceed 3.5 seconds.

The counting is performed in the following manner. The positive drops of voltage across resistor (R27) which correspond to the moments of the end of the dashes exceeding 3.5 seconds, are delivered through the differentiating circuit (C21, R30) and the diode tube ($\Lambda 12$) to the capacitor (C22), charging the latter.

The negative drop corresponding to the moment removed for 3.5 sec. from the beginning of the next dash, discharges the capacitor (C21). Meanwhile, capacitor (C22) remains charged due to the diode ($\Lambda 12$).

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If these alternate voltage drops are repeated three times, the capacitor (C22) will be charged stepwise up to the value at which the grid-to-cathode voltage of the tube (//13) becomes equal to the cut-off voltage and the tube begins to conduct normally. However, it will occur only if the dashes do not exceed 6.0 seconds, while the spaces between them do not exceed 1.5 seconds.

In the opposite case, as stated above, either the working tube of the dash maximum value monitoring circuit (//II) or the tube (//IO) of the space monitoring circuit will conduct normally.

These tubes have a common plate circuit to which the winding of the polarized relay (P3) is connected. As soon as the current flows through one of these tubes, the armature (A) of the P3 relay is attracted to contact (//) and discharges capacitor (C22), discarding the counting of the number of dashes.

Resistor (R31) is connected in order to decrease the initial discharging current of this capacitor.

When normal alarm signals are transmitted, tubes (//IO, //II) remain conductively closed and at the end of the third dash the tube (//13) will conduct normally, the other winding of the polarized relay being connected to its plate.

The armature (A) of the (P3) relay is connected with contact (//) and applies the voltage to the winding of the output relay (P2).

The relay is supplied with the line voltage through the

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additional resistors (R44, R45), if the receiver is supplied from the mains and storage battery. When the receiver is supplied only from the storage battery, the (P2) relay is fed through a converter.

The power supply of this relay is switched-over by means of the same switch that switches over the receiver from one kind of supply to the other (172).

The receiver is fed through switch (171), which closes the four poles of the power lines when the receiver is switched-on. The receiver circuit is isolated (D.C.) from the chassis and the housing.

Four fuses (17p 1 - 17p 4) are provided in the power lines of the ship's mains and batteries.

The required kind of power supply (storage battery or combined-mains and storage battery) is selected with switch (172).

In addition to that, when the receiver is fed from the ship's 110-volt mains, the contacts of this switch short-circuit the resistors (R46, R44), which will decrease the excess of voltage in case of the receiver supplied with power from 220-volt mains.

Another pair of this switch contacts connects the H.V. and L.V. negative wires in the receiver when it is fed through the converter, which permits to feed the working coil of the output relay (P2) from the battery.

The receiver is provided with a signalling device for warning about the drop of supply voltages. For this purpose

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relay PI (Fig.5) is employed, which is connected into the filament circuit.

When the receiver is switched on, the filament circuit has a low "cold" impedance of about 6 ohms. Therefore at the first moment a 4 A current flows through the coil and the relay operates. The winding is so designed that the relay releases when the voltage drop at the battery exceeds 15%. Consequently, when the receiver is switched off for a short time and then is again switched in, the relay does not operate because the filaments have no time to cool during this short interval and preserve the nominal "hot" impedance.

In that case to make the relay operate, it is necessary to depress and release the push button (K1), whose contacts short-circuit the filaments circuit by means of resistor (R₄₃). Consequently, the winding of the (PI) relay obtains a sufficient current for its operation.

Thus, when the receiver is switched on, the (PI) relay operates.

When one of the voltages drops, the (PI) relay is released and applies the voltage to the lamp (H16), which signals about the trouble, and to the line of bells, which are located both in the radio room and in the cabin of the ship's radio officer.

The operation of the (P₁) relay due to the reception of alarm signals connects the (H17) lamp "ΠΡΕΒΟΥΙΑ" ("Alarm") and delivers the battery voltage to the bell lines which are located both in the radio room and in the cabin of the ship's

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radio officer. Besides that, the relay (R_2) has a blocking contact, which keeps the relay in the "operating" position irrespective of the further behaviour of the relay (R_3) contacts (after the closure at the end of the third dash). The alarm signalling system is switched off by depressing the push button (KI), whose contacts open the circuit of the (R_2) relay power supply.

The H.V. supply line of the receiver is provided with an inductance-capacitance filter.

The lines which lead to the converter are also provided with filters, which protect the lines from disturbances occurring in the converter.

The receiver includes a meter used to check on voltages in the power lines and currents flowing through the different tubes. The meter is connected to the individual circuits through switch ($\Pi 3$).

When the switch knob is set to various positions the meter reads:

- (1) Cathode current of the tube in the first HF stage;
- (2) Same, in the second HF stage;
- (3) Same, in the third HF stage;
- (4) Plate current of the detector tube;
- (5) Plate current of the cathode - loaded stage tube;
- (6) Summary of plate currents in the working tubes of the circuits for monitoring the dashes maximum value and the spaces;
- (7) Plate current of the working tube in the circuit of

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dash counting;

(8) Battery voltage;

(9) Circuit voltage;

(10) Plate current of the 6H8C or 6H9C tube, inserted into the control panel (K/I) (second pin);

(11) Same (fifth pin).

Resistors (R_{34} - R_{43}) are either additional resistances or shunts to the check meter in different positions of the switch (I 3).

Resistors (R_{49} , R_{50}) decrease the excess of filament supply voltage of the tube which is inserted into the control panel (K/I).

The push button (K2) contact "ИЗ ЗАМКИ" ("Close"), short-circuits one of the resistors when the 6H8C tube is checked.

3. Construction of the Receiver

The automatic alarm receiver is mounted in a cast aluminum housing.

The H.F. unit and the selector unit are mounted upon separate chassis which are fastened to the cover, the rest of units is mounted upon the cover itself, in its lower part.

The control and signalling devices, as well as the antenna socket, are located on the front panel of the cover.

The power supply cables and the signalling cables are connected to a terminal block, which is fixed inside the housing, through glands located on the lower side of the housing.

The cover is connected to the housing by means of hinged

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screws and is to be opened to the left at 180°.

The housing has four brackets for installing the shock absorbers, on which the receiver is secured to the vertical bulkhead.

4. Installation and Putting into Operation

1. Secure the receiver on the vertical bulkhead.
2. Lay power supply and signalling cables to the receiver.
3. Connect the antenna.
4. Switch on the power supply source (The works delivers the equipment for 220 V switching).

Before switching on the power supply it is necessary to perform the following operations:

(a) Set the switch 2 either to position "БАТАРЕЯ" ("Battery"), when power is supplied by the storage battery, or to position "СЕТЬ" ("Mains"), when power is supplied by the ship's mains and storage battery.

(b) Set the switch 2 either to position "БАТАРЕЯ" ("Battery") or "СЕТЬ" ("Mains"), accordingly. When the power supply is "On" the pointer of the motor should be within the limits of the red sector.

(c) When power is derived from the 220-volt mains and storage battery, the two jumpers upon the plate of resistors should be disconnected. When power is obtained from 110-volt mains, the jumpers should be connected (Fig.7).

5. The alarm bells are switched off by depressing the push button, "БЫКЛ. ЗВОНКА" ("Bells off") not earlier than 5.0 seconds after the signalling devices have operated.

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Trouble - Shooting Chart

Nos	Symptom	Cause	Remedy
1.	Signalling lamp is alight. Failure in power supply circuits	(a) Battery voltage attenuation (b) Battery voltage drop of short duration (c) Filament burnt in one of the tubes (d) Break in filament circuit wiring (e) Line voltage attenuation. (f) Line fuse burnt out	(a) Charge battery (b) Depress and release push button " <i>БДИМ</i> " ("Bells Off") (c) Locate defective tube either by brightness of cathode glow (for 6H8C and 6H9C) or by meter readings at position "6K3" (for 6K3). Replace. (d) Disconnect receiver, locate break point by means of tester, and repair. (e) Increase voltage in mains. (f) Replace.

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Nos	Symptom	Cause	Remedy
		(g) One of following elements is inoperative: regulator <i>V</i> -20, choke coil <i>Ap</i> 1, capacitors <i>C</i> 23, <i>C</i> 24, contacts of <i>H</i> 1, <i>H</i> 2 switches, relay <i>R</i> 3, resistors <i>R</i> ₄₆ , <i>R</i> ₄₇	(g) Locate inoperative element and either replace or repair on site.
		(h) Short-circuit on <i>V</i> -20.	(h) Disconnect receiver, locate short-circuit or break by means of tester, and repair.
		In case of power supplied from converter:	
	(a) Battery voltage attenuation		(a) Charge battery.
	(b) Converter brushes burnt; collector dirty		(b) Grind-in or replace brushes; clean converter collectors
	(c) See I (e), (f), (g).		(c) See I (e), (f), (g).

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Nos	Symptom	Cause	Remedy
2	Neon-filled tube is glowing at receiver input	Short-circuit between line pole and housing	Switch on receiver, locate short-circuit, and repair.
3	Check meter needle does not deflect in switch positions: A. "11-6K3" "12-6K3" "13-6K3" "14-6H8C" "10-11-6H8C" B. "5ATAPEH" ("Battery"), "LEIb" ("Mains")	(a) Corresponding tube is defective. (b) Break or short-circuit in corresponding tube supply circuit (a) Resistors R_{41} , R_{42} are inoperative (b) Circuit break	(b) Locate break or short-circuit, and repair.
4	Meter needle is out of scale	Either one of additional resistors or resistor, one of shunts is inoperative	Locate defective and replace

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6. Instructions for Voltage Tests in Power Supply
Circuits and for Checking Tubes

The receiver operation test is performed by following the procedure below:

The check meter switch is set to all positions alternately. Normally in positions "1-6K3", "2-5K3", "3-6K3", "8-6K3C", "10-11-5K3C", "БАТАРЕЯ" ("Battery"), "Семь" ("Mains") the meter needle should be within the limits of the red sector.

In position "4-6H3C" the check meter needle should deflect towards the red sector when the push button "КОИТРОЛЬ" ("Test") is depressed if the antenna is disconnected, and should not deflect if the antenna is connected. This corresponds to the normal operation of the H.F. amplifier and detector.

In position "13-6H9C" the check meter needle deflects towards the red sector if the push button "КОИТРОЛЬ" ("Test") delivers three coded alarm signals, with the antenna disconnected.

Positions "2-6H8C" and "5-6H8C" serve for checking the tubes 6H8C and 6H9C which cannot be checked directly in the circuit. The tube is plugged into a special socket in the lower part of the auto-alarm, and the push button "КОИТРОЛЬ" ("Test") is depressed. If the tubes are in good order, the check meter needle deflects towards the red sector (6H8C) or towards the fifth division of the scale (6H9C).

The operation of the monitoring circuits in the selector is checked (with the antenna disconnected) in the following

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(a) The check-meter switch is set to position "A10-11-6H8C". The test push button "КОИТРОЛ" ("Test") delivers a long dash.

Simultaneously the stop watch is actuated. The stop watch should read 3.0 ± 0.5 sec. at the moment when the meter needle drops to zero.

(b) The check-meter switch is set to position "A10-11-6H8C". The test push button "КОИТРОЛ" ("Test") delivers a long dash.

The stop watch is actuated simultaneously.

The stop watch should read: 3.0 ± 0.5 sec. at the moment when the needle drops to zero, 6.0 ± 0.5 sec. at the moment when the needle begins to move towards the red sector and 7.0 ± 0.5 sec. at the moment when the needle has reached the red sector.

(c) The check-meter switch is set to position "A10-11-6H8C". Push button "КОИТРОЛ" ("Test") delivers a dash of 5.0 sec. duration. The stop watch is actuated at the moment of the dash end.

The check-meter should read as follows:

In 5.0 ± 0.5 seconds after the end of the dash, the meter needle should begin to move towards the red sector, and in 6.0 ± 0.5 seconds after the end of the dash, the needle should reach the red sector.

The operation of signalling circuits is checked (with antenna disconnected) in the following way:

Push button "КОИТРОЛ" ("Test") delivers the alarm signal (the switch is set to position "A4-6H8C") with a

space duration of 0.01 to 0.5 seconds.
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After three correctly sent dashes the alarm signalling system should operate.

The signalling system should be disconnected not earlier than in 5 seconds by means of push button " *БЫЛИ. ЗВОНОК* " ("Bells Off"). Then dashes are delivered with a duration of less than 3.5 sec. or more than 6 sec. and the space duration is more than 1.5 sec., the alarm signalling system should not get triggered.

8. Scope of Delivery List

Items	Description	Qty	Remarks
1	Automatic-alarm receiver	1	
2	Rotary converter PY II-AM	2 Sets	1 of the sets in "Spare Parts and Accessories"
3	Headphones TA-4	1 set	
4	Connector box type 9	1	
5	Antenna cable	1	
6	D.C. 24 - volt alarm bell	3	
7	Two boxes with spare parts	1 set	
8	Delivery documents:		
	(a) Description	2	
	(b) Service list		

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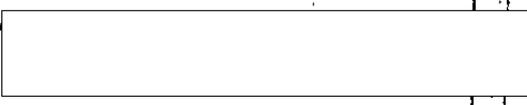


Items	Description	QTY	Remarks
1	Секретарь КБ/И	1	
2	" КБ/И	1	
3	" МБ/И	1	
4	" МБ/И	1	
5	" МБ/И	1	
6	" МБ/И	1	
7	" МБ/И	1	
8	"	1	
9	"	1	
10	Революция	1	
11	"	1	
12	"	1	
13	"	1	
14	"	1	
15	"	1	
16	"	1	
17	"	1	
18	"	1	
19	"	1	
20	"	1	
21	"	1	
22	" ПДБ	1	
23	" ПДБ	1	
24	" ПДБ	1	
25	" ПДБ	1	

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Items	Description	Qty	Remarks
26	Vacuum tube 6X3	6	
27	Vacuum tube 6H30	3	
28	" 6H90	2	
29	" 6C90	2	
30	Incandescent lamp LL-10	4	
31	Neon tube NH-5	2	
32	Tube socket 11A-2K	1	
33	Switch P3 -224	1	
34	Resistor 11K-45-0.25	18	
35	11K" -45-4	18	
36	Polarized relay P11 -5, category No. PG4-522-006 /4	1	
37	Potentiometer P-17 AM, 27/225 V, 11 W	1	
38	Screw, cyl. M4 x 10	2	
39	Screw, cyl. M4 x 6	2	
40	Screw, cyl. M3 x 6	2	
41	Screw M3 x 12, countersunk	2	
42	Screw M3 x 10, countersunk	2	
43	Nut M4	2	
44	Nut M3	2	
45	Spring washer, 4 mm	2	
46	Spring washer, 3 mm	2	
47	Washer 4	2	
48	Washer 3	2	
49	Contact plate P119-06-04	2	
50	Resistor BC-0.25-1-1500-11	1	

S-E-C-R-E-T
NO FOREIGN DISSEM

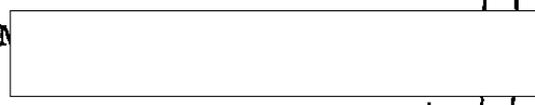
NO FOREIGN DISSEM

11. Parts List, Schematic Diagram 10.

Item	Symbol	Description	Q-ty	Resistor
1	R1, R2, R3	Resistor 110 ohms \pm 10% 0.25 W	3	
2	R10, R11, R12	Resistor 1.5 Kohms \pm 10% 0.25 W	3	
3	R15, R31, R30, R41	Resistor 1.5 Kohms \pm 10% 0.25 W	4	
4	R14, R15	Resistor 68 Kohms \pm 10% 0.25 W	2	
5	R16	Resistor 6.8 Kohms \pm 10% 0.25 W	1	
6	R17	Resistor 2.0 megohm \pm 10% 0.25 W	1	
7	R18, R19, R22	Resistor 3.0 meg. \pm 10%; 0.25 W	3	

NO FOREIGN DISSEM

S-E-C-R-E-T
NO FOREIGN DISSEM



Item	Symbol	Description	Qty	Remarks
13	R20	Resistor 10 Kohms \pm 10%; 0.25 W	1	
14	R23	Resistor 4.3 Kohms \pm 10%; 1.0 W	1	
15	R24, R33	Resistor 20 Kohms \pm 10%; 0.25 W	3	
16	R26	Resistor 1.0 Megohms \pm 10%; 0.25 W	1	
17	R31	Resistor : Kohm \pm 10%; 0.25 W	1	
18	R25, R23,	Variable resistor: 10 Kohms, linear	4	
19	R29, R32			
20	R34, R37, R38	Resistor 15 ohms \pm 10%; 0.25 W	3	
21	R35	Resistor 160 ohms \pm 10%; 0.25 W	1	

S-E-C-R-E-T
NO FOREIGN DISSEM

S-E-C-R-E-T
 NO FOREIGN DISSEM



Items	Symbol	Description	Q-ty	Remarks
16	R36	Resistor 91 ohms \pm 10%; 0.25 W	1	
17	R39	Resistor 24 ohms \pm 10%; 0.25 W	1	
18	R40	Resistor 510 ohms \pm 10%; 0.25 W	1	
19	R42	Resistor 480 Kohms \pm 10%; 0.25 W	1	
20	R44, R45	Resistor 910 ohms \pm 5%; 10 W	2	
21	R46	Resistor 1000 ohms \pm 10%; 10 W	1	
22	R47	Resistor 75 ohms \pm 5%; 10 W	1	
23	R48	Resistor 10 ohms \pm 10%; 10 W	1	

S-E-C-R-E-T
 NO FOREIGN DISSEM

S-E-C-R-E-T
NO FOREIGN DISSEM

Items	Symbol	Description	Qty	Remarks
24	R49, R50	Resistor 30 ohms ± 10%; 10 V	2	
25	R52, R53	Resistor 390 ohms ± 10%; 10 V	2	
26	C1, C2, C3	Capacitor 4700pF ± 10%; 250 V	2	
27	C4, C5	Capacitor 1.0 μF ± 10%; 250 V	2	
28	C6, C7	Capacitor	2	
29	C8, C9, C10, C11, C12, C13	Capacitor 220pF ± 5%; 250 V	5	
30	C14	Capacitor 0.05 μF ± 10%; 200 V	1	
31	C15, C17, C19, C20	Capacitor 4.0 μF ± 10%; 200 V	4	

S-E-C-R-E-T
NO FOREIGN DISSEM

NO FOREIGN DISSEM

Item	Symbol	Description	Q-ty	Remarks
32	C16, C22, C23, C25	Capacitor 0.5mf, 10%, 400 V	4	
33	C18	Capacitor 0.005mf, 10%, 200 V	1	
34	C21	Capacitor 0.1mf, 10%, 400 V	1	
35	C24	Electrolytic capacitor, hermetically sealed, 500, 100 V	1	
36	L1, L2, L3, L4, L5, L6	Inductance coil, 375 microhenry ± 5%, 12 ohms	6	
37	p1	L.F. choke coil 4.5 henry ± 10%, 35.3 ohms	1	



S-E-C-R-E-T
 NO FOREIGN DISSEM

NO FOREIGN DISSEM

Items	Symbol	Description	Qty	Unit	Remarks
78	A1, A2, A3	Vacuum tube 6X3	3		Rotate out off during test
79	A4-5, A6-7 A8-9	Vacuum tube (100)	4		
80	A12-13	Vacuum tube 14G	1		
	A14	Inductor 1000 ohms 1/2W	1		
	A15	Voltage stabilizer (100-200)	1		
	A16-17	Inductors 1000 ohms 1/2W	2		
		Electromagnetic relay	1		

No. P14.522.020 A1

14-14
 14-15
 14-16
 14-17
 14-18
 14-19
 14-20
 14-21
 14-22
 14-23

SECRET
 NO FOREIGN DISSEM

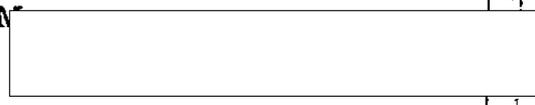
SECRET

NO FOREIGN DISSEM

Item	Symbol	Description	Qty	Description	Remarks
45	P2	Electromagnetic relay No. PC4.523, 020.41	1		"=E460 burns PDJ 517.C.13; 250 ohms + 100
46	P3	Polarized relay No. PC4.522, 000.41	1		"=E460 burns PDJ 517.C.13; 250 ohms + 100
	Пр1, Пр2	Fuse 0.15 A	2		
	Пр3, Пр4	Fuse 4.0 A	2		
	КП	Octal tube socket	1		
50	М	Microammeter, magneto electric, 500 μ A, 500 ohms	1		
51	П	3-pole switch	1		2 tumblers 77-1-2

SECRET
 NO FOREIGN DISSEM

NO FOREIGN DISSEM



Items	Symbol	Description	Q-ty	"	Description	Remarks
52	Π_2	Roller 3 - pole switch	1			
53	Π_3	Wafer switch	1			
54	R1, R2	Push-button	2			Red-locks
55	R27	Resistor 3 Volms \pm 10%	1			
		25 "				
	R54	Resistor 2 ohms	1			

S-E-C-R-E-T

NO FOREIGN DISSEM

S-E-C-R-E-T
NO FOREIGN DISSEM

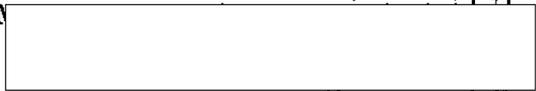


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S-E-C-R-E-T
NO FOREIGN DISSEM

SECRET

NO FOREIGN DISSEM

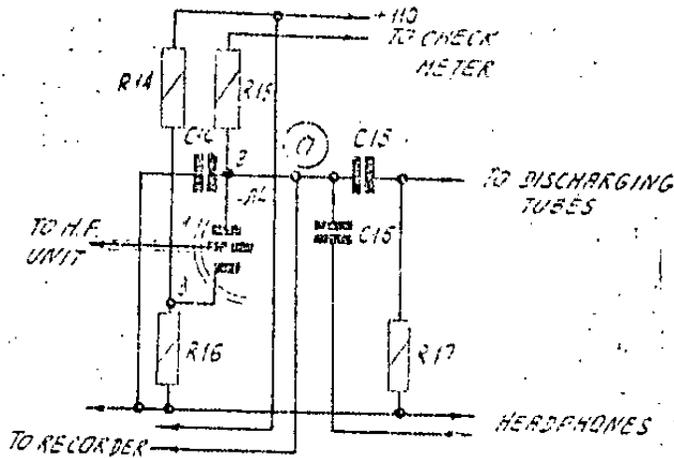


FIG. 1.

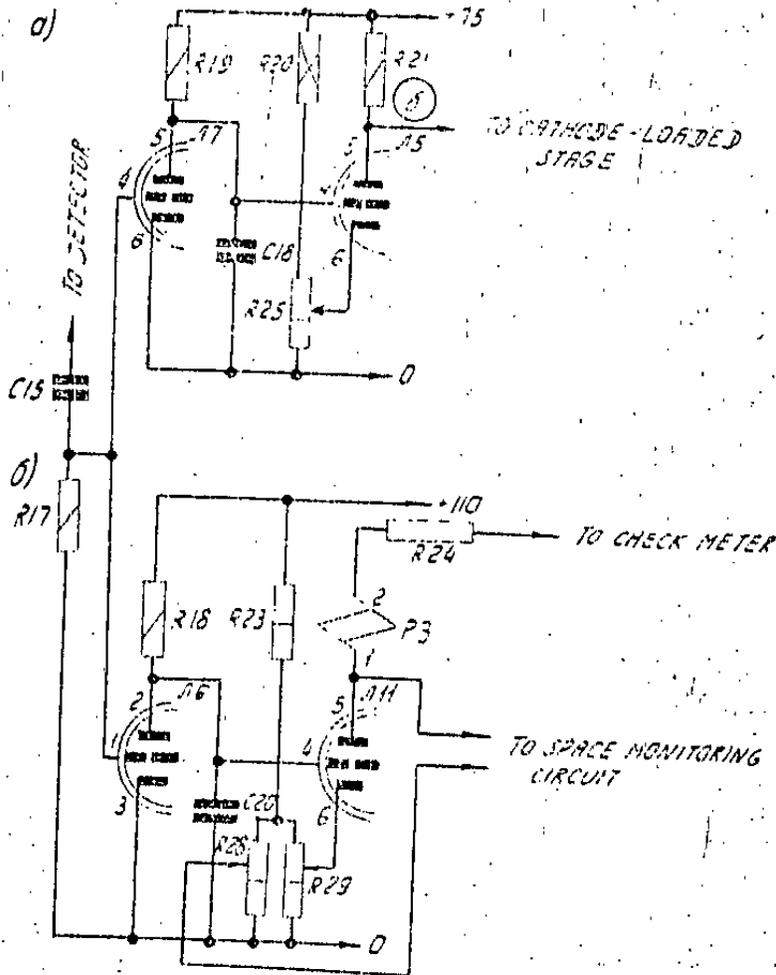
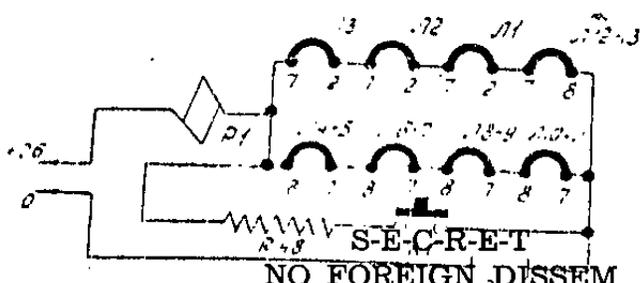
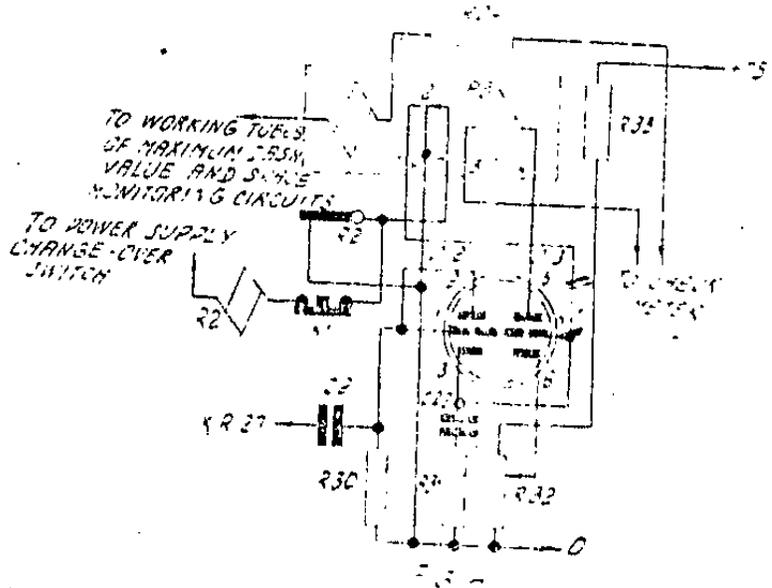
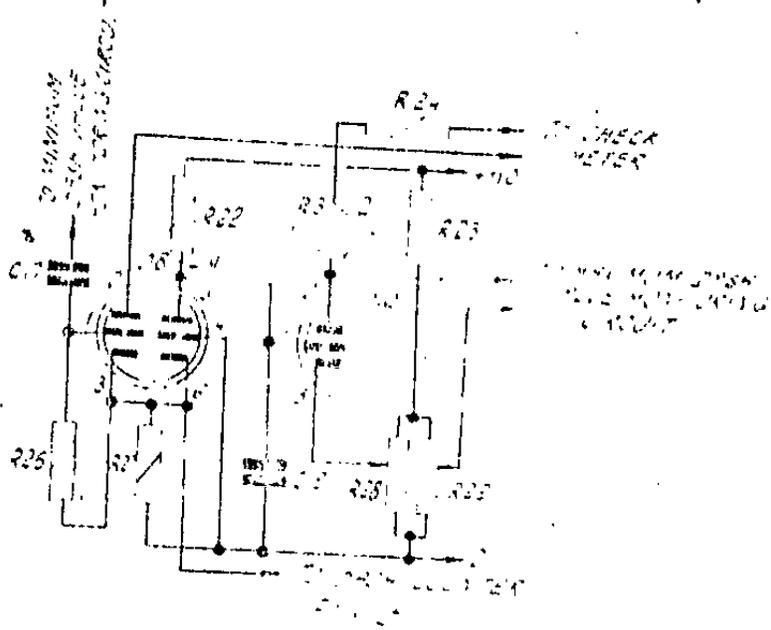
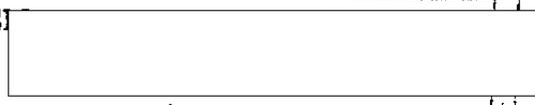


FIG. 2

SECRET
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S-E-C-R-E-T

NO FOREIGN DISSEM



S-E-C-R-E-T
NO FOREIGN DISSEM

~~S-E-C-R-E-T~~
NO FOREIGN DISSEM

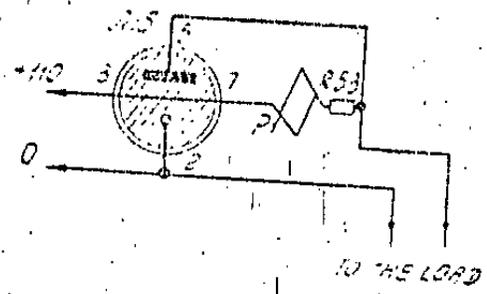
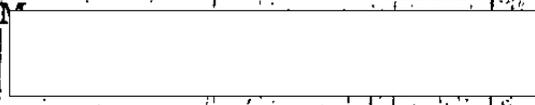


FIG. 6.

AT 110 VOLTS - INSTALL
JUMPERS

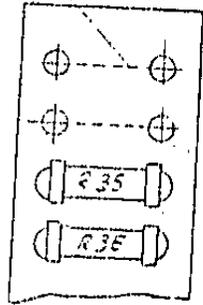
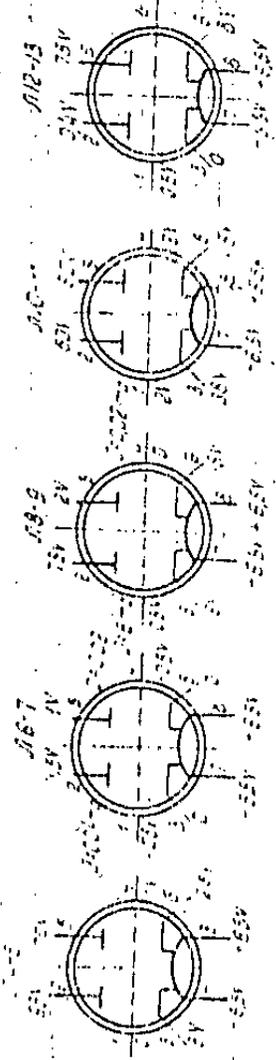


FIG. 7

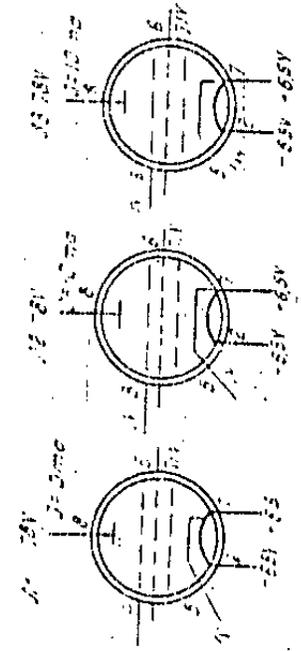
S-E-C-R-E-T
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S-E-C-R-E-T
NO FOREIGN DISSEM

7 VACUUM TUBES RATING CHART
SELECTOR UNIT



H.F. UNIT



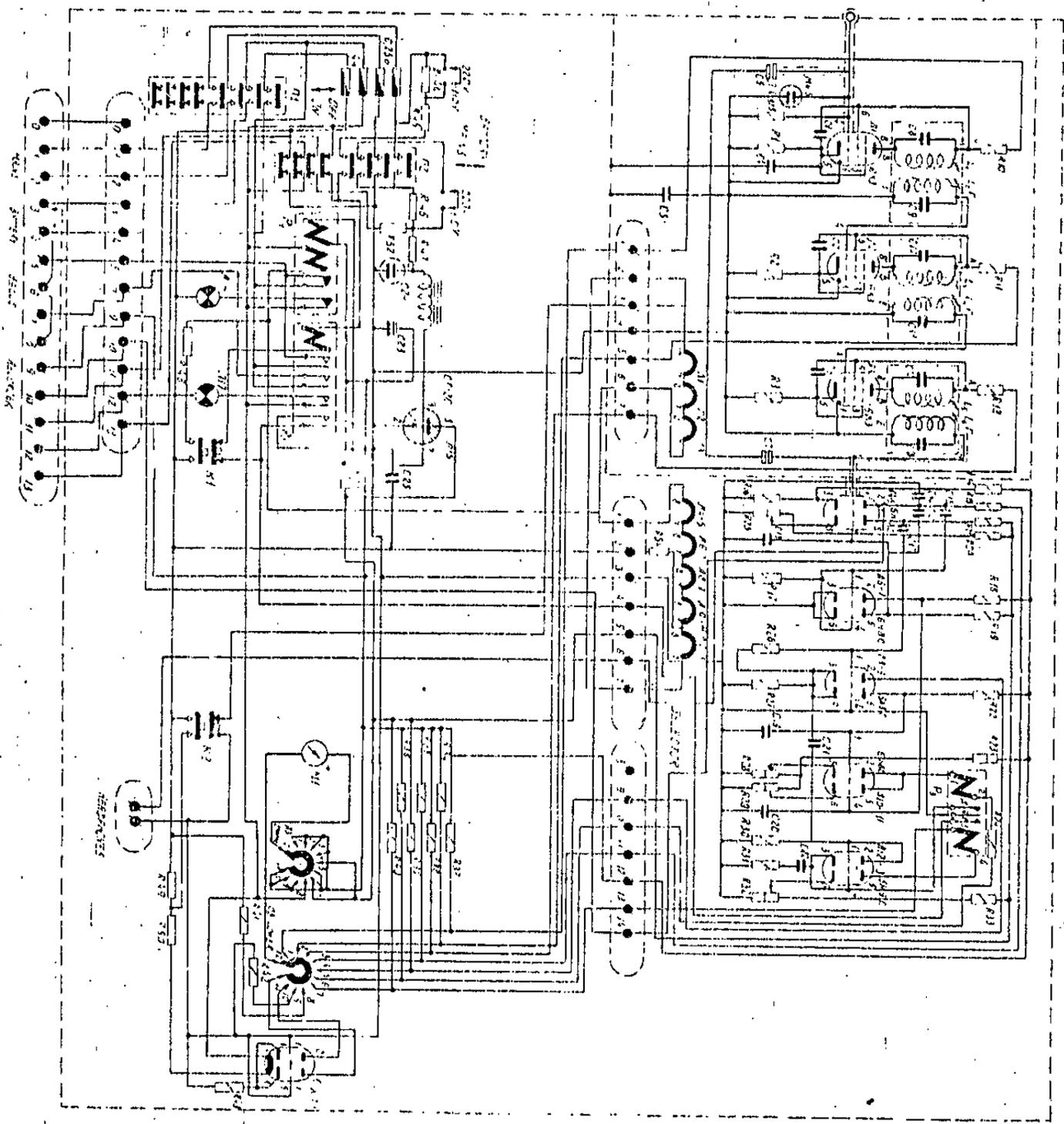
NOTE:
THE VOLTAGE DATA ARE GIVEN RELATIVE TO ZERO
CENTER OF TUBE (S)
THE TUBES SHOWN IN THESE ARE MOUNTED
DIRECTLY ON THE LOUSE OF THE JARVIS
THE MEASUREMENT IS PERFORMED IN TERMS OF A
500-1000 OHMS VOLTMETER TYPE "T" IN THE
NEUTRAL POSITION OF THE CIRCUIT (WITH ANTENNAS
DISCONNECTED)

Fig. 8

S-E-C-R-E-T
NO FOREIGN DISSEM

S-E-C-R-E-T

NO FOREIGN DISSEM



SCHEMATIC DRAWING

S-E-C-R-E-T
NO FOREIGN DISSEM

S-E-C-R-E-T

NO FOREIGN DISSEM

12. INSTALLATION - WIRING DIAGRAM

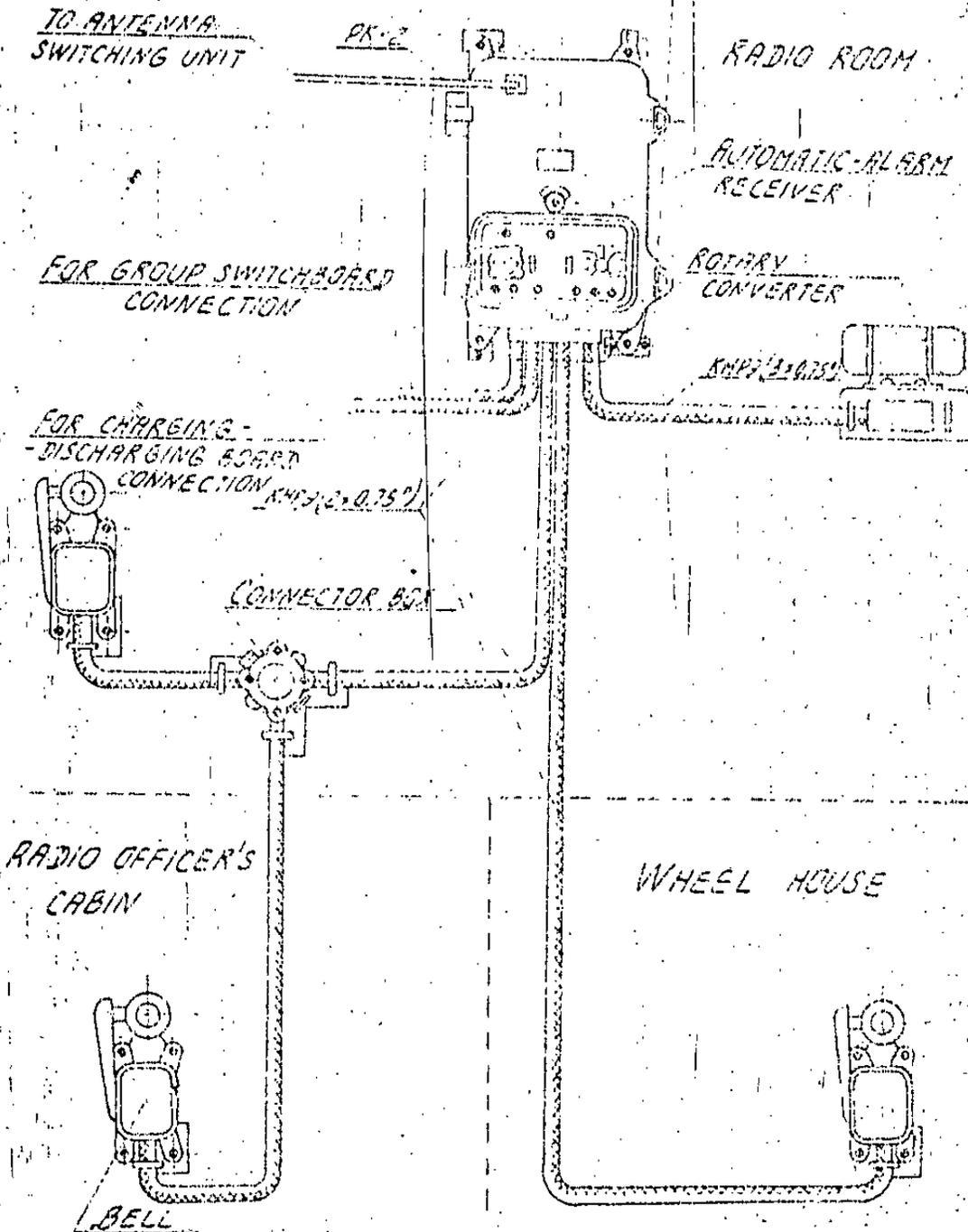


FIG. 10

S-E-C-R-E-T

NO FOREIGN DISSEM

S-E-C-R-E-T

NO FOREIGN DISSEM

12. INSTALLATION - WIRING DIAG

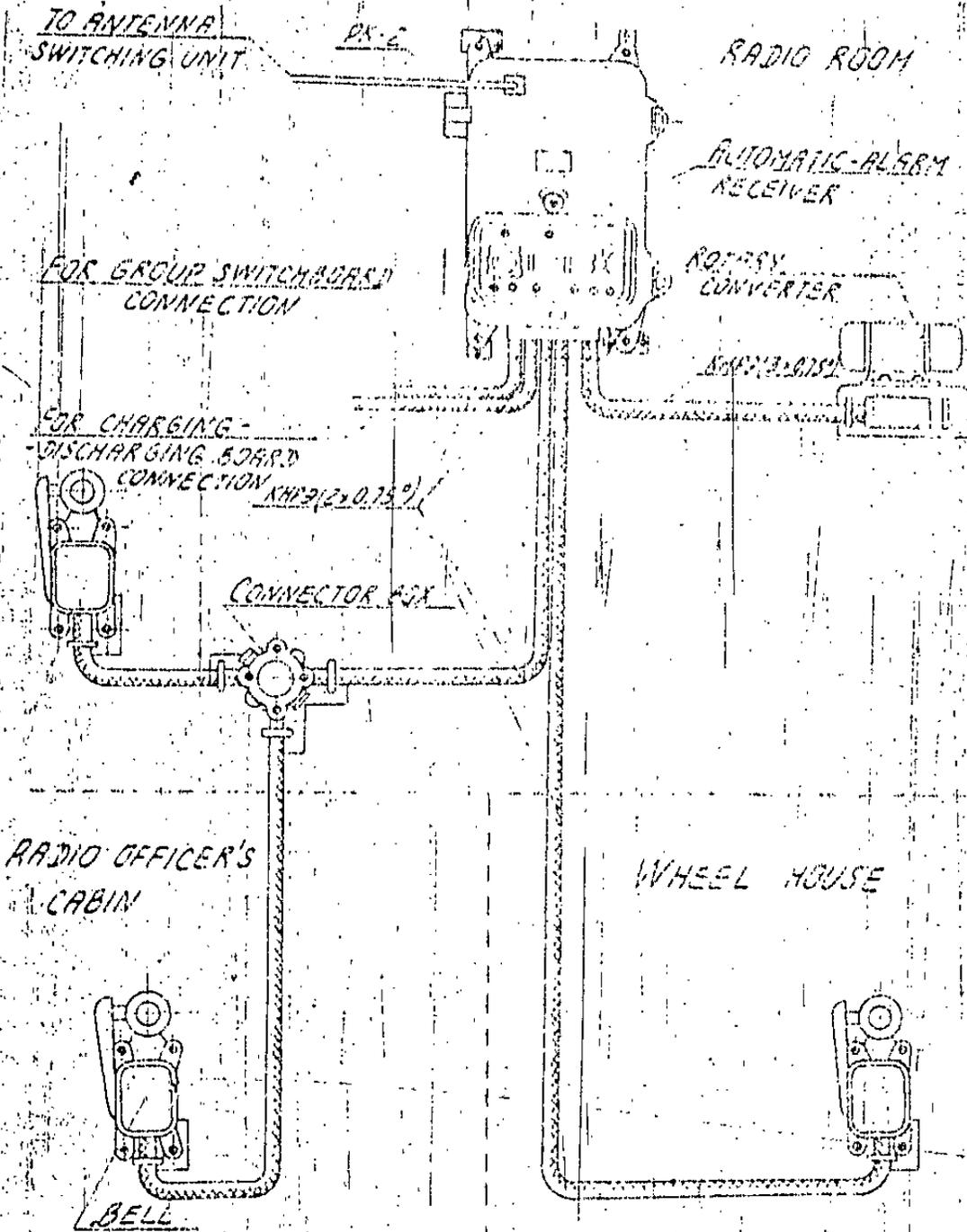


FIG. 10

S-E-C-R-E-T

NO FOREIGN DISSEM

S-E-C-R-E-T

NO FOREIGN DISSEM

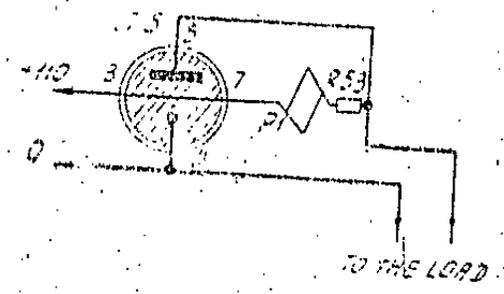


FIG. 6.

FT 110 VOLTS - 115V. 60HZ
JUMPERS

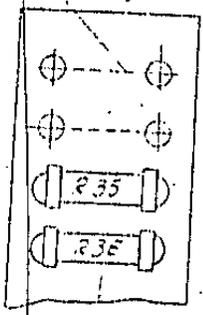


FIG. 7

S-E-C-R-E-T
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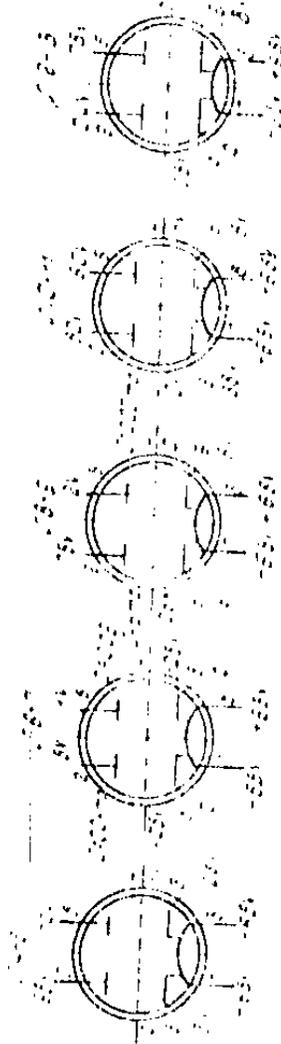
S-E-C-R-E-T

NO FOREIGN DISSE



7 VACUUM TUBES RATING CHART.

SELECTOR UNIT



NOTE:
 THE VACUUM TUBES ARE RATED FOR
 OPERATION AT 100% OF THEIR
 RATED LIFE.
 THE REQUIREMENT IS MET BY THE
 USE OF THE FOLLOWING TUBES:
 6X4 (600V)
 6X5 (600V)
 6X6 (600V)
 6X8 (600V)
 6X9 (600V)

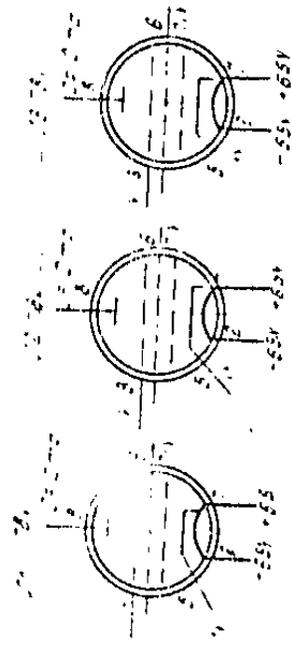


FIG. 8

S-E-C-R-E-T

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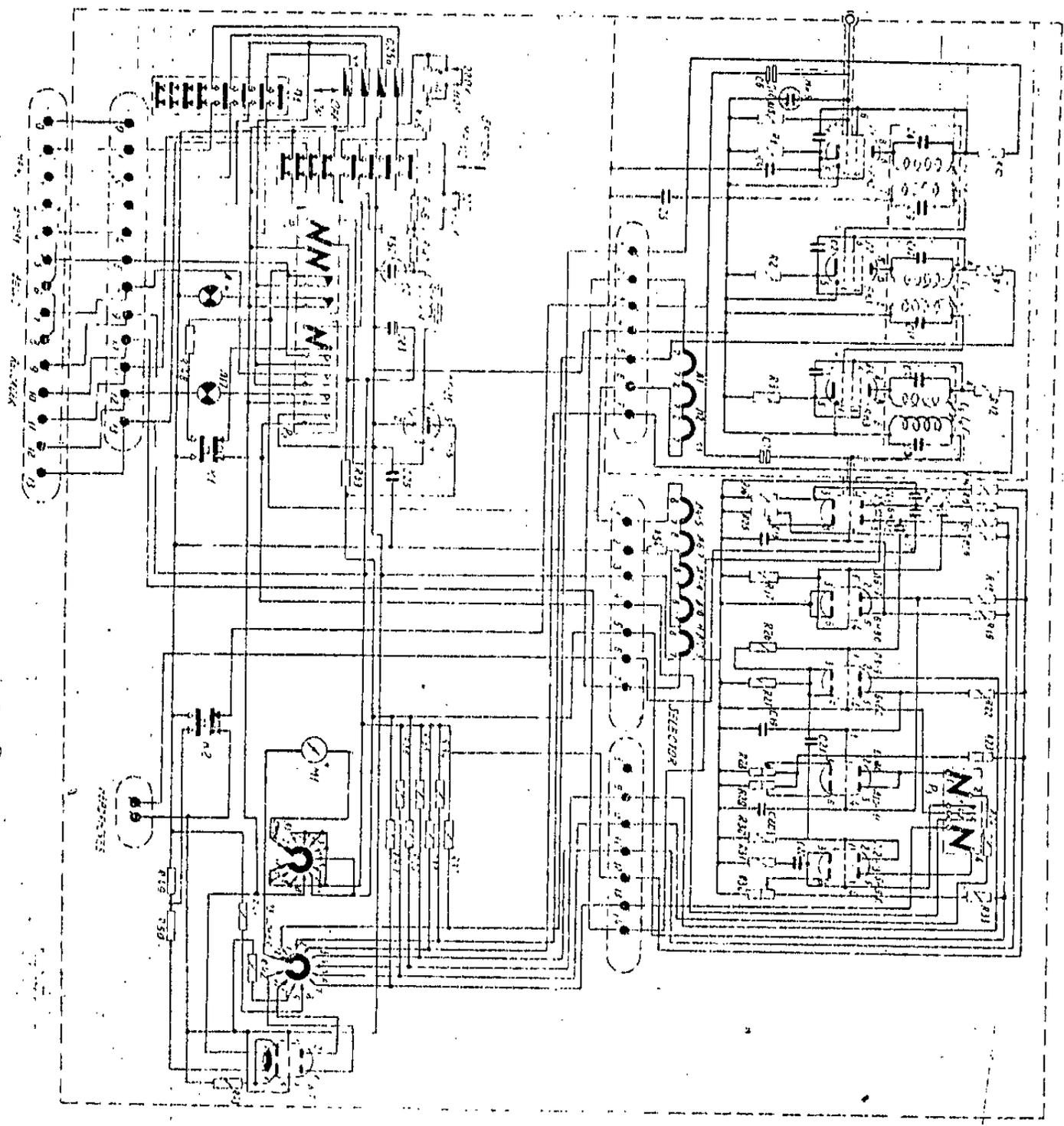


FIG 9

S-E-C-R-E-T
NO FOREIGN DISSEM

S-E-C-R-E-T

NO FOREIGN DISSEM

12. INSTALLATION - WIRING DIAGRAM

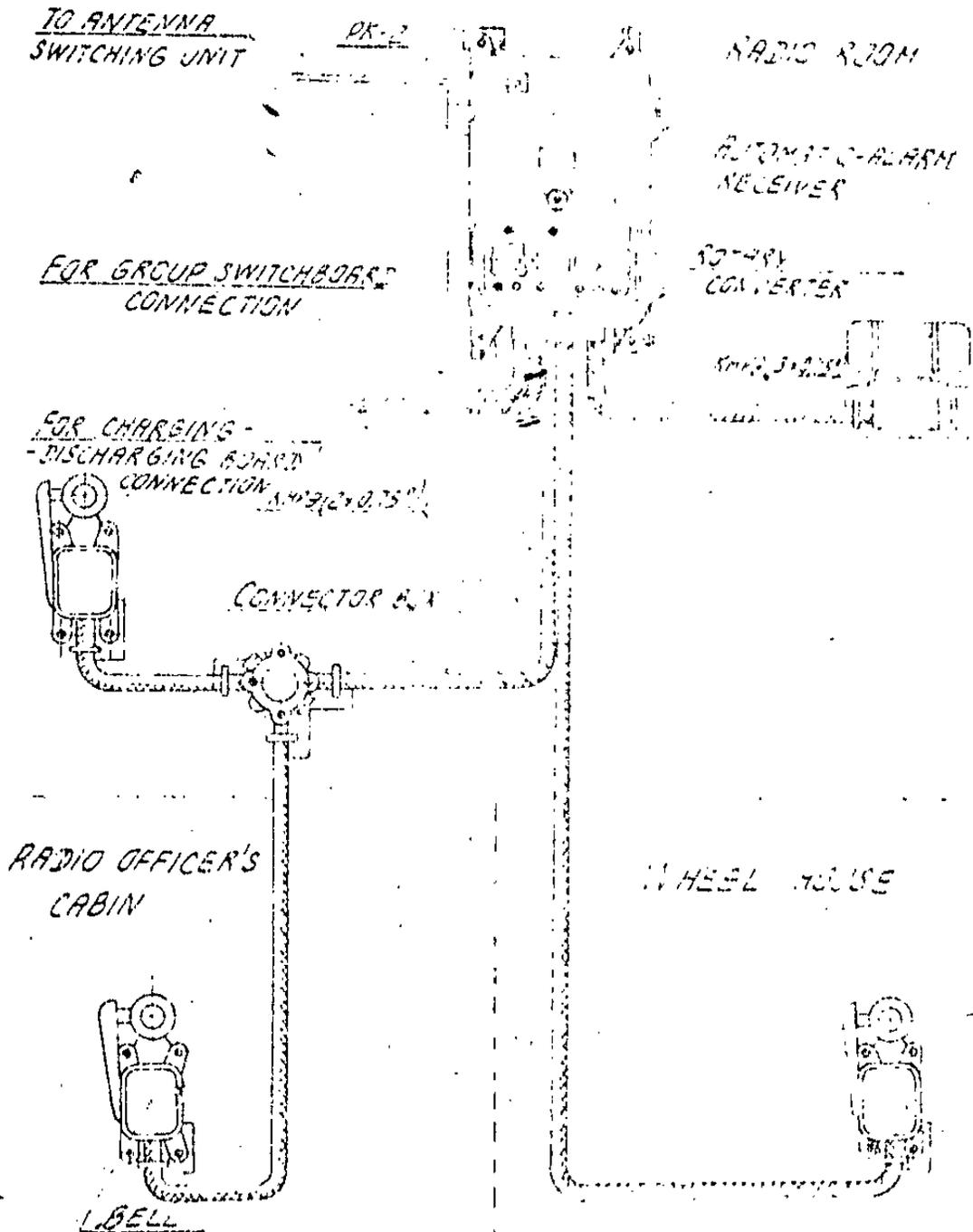


FIG. 10

S-E-C-R-E-T

NO FOREIGN DISSEM